

## ABSTRACT OF THE DISCLOSURE

The present invention provides a transgenic animal expressing the reporter gene, luciferase, driven by a promoter (e.g. 5 the E2F1 promoter) that acts as a sensor of cell cycle. The luciferase substrate, luciferin, emits light when metabolized, and the light is transmitted through mammalian tissues. Therefore, the transgenic animal model of the present invention allows for monitoring of areas of major cell cycle activity, a characteristic of cancer cells, 10 under adequate visualization conditions. These transgenic animals are useful as *in vivo* models for testing preventative measures for cancer as well as for testing novel therapeutic modalities.